DESCRIPTION

Title of Invention: NOODLE STRING CUTTING DEVICE AND RAW NOODLES

Technical Field

[0001] The present invention relates to a noodle string cutting device configured to cut a dough sheet into noodle strings by cutting blade rolls when producing noodles, and raw noodles formed by the noodle string cutting device.

Background Art

[0002] A typical method of producing noodles includes: mixing and kneading noodle materials such as wheat flour and starch to form a noodle dough; and rolling out the noodle dough into a dough sheet having a predetermined thickness. A noodle string cutting device cuts the dough sheet into noodle strings each having a predetermined thickness. The obtained noodle strings are subjected to processing, such as cutting or steam-boiling. A typical method of cutting the dough sheet into the noodle strings by the noodle string cutting device is as follows. The noodle string cutting device includes a pair of opposing cutting blade rolls configured to rotate, and the dough sheet passes through between the pair of cutting blade rolls to be cut into strings. For example, a noodle string cutting device (noodle string dividing device) has been developed, which separates the noodle strings using four separating blades, the noodle strings being formed by cutting the dough sheet using a pair of cutting blade rolls (roll cutters) (see PTL 1, for example).

Citation List

Patent Literature

[0003] PTL 1: Japanese Laid-Open Utility Model Application Publication No. 57-203787

Summary of Invention

Technical Problem

[0004] However, the invention described in PTL 1 is not made for the purpose of stacking the noodle strings on a conveyor such that in the steam-boiling, sticking of the noodle strings can be reduced, and the noodle strings can be entirely and uniformly gelatinized.

[0005] ~~The present invention was made to solve the above problems, and an object~~ Embodiments of the present invention ~~is to~~ provide a noodle string cutting device capable of stacking noodle strings on a conveyor such that in steam-boiling, sticking of the noodle strings can be reduced, and the noodle strings can be entirely and uniformly gelatinized, and raw noodles formed by the noodle

string cutting device.

Solution to Problem

[0006] ~~To solve the above problems, a noodle string cutting device according to the present invention is~~ According to a first aspect of the present invention, there is provided a noodle string cutting device configured to cut a dough sheet into noodle strings to supply the noodle strings to a conveyor, a transfer speed of the noodle strings by the conveyor being lower than a cutting speed at which the noodle strings are cut from the dough sheet, the noodle string cutting device including: a first cutting blade roll and second cutting blade roll configured to rotate in opposite directions in an engaged state to cut the dough sheet into the noodle strings; a first separating teeth row and second separating teeth row contacting an outer periphery of the first cutting blade roll at respective positions different from each other in a rotational direction of the first cutting blade roll and configured to separate the noodle strings from the first cutting blade roll; a third separating teeth row and fourth separating teeth row contacting an outer periphery of the second cutting blade roll at respective positions different from each other in a rotational direction of the second cutting blade roll and configured to separate the noodle strings from the second cutting blade roll; and a chute member provided so as to correspond to falling positions of any of the noodle strings separated by the first separating teeth row, the noodle strings separated by the second separating teeth row, the noodle strings separated by the third separating teeth row, and the noodle strings separated by the fourth separating teeth row and configured to guide the noodle strings onto the conveyor, wherein: the fourth separating teeth row, the third separating teeth row, the second separating teeth row, and the first separating teeth row are provided in this order from an upstream side toward a downstream side in a conveying direction of the conveyor; and the chute member is provided such that two or more sets are formed, each of which includes the adjacent separating teeth rows among the first to fourth separating teeth rows and in each of which the chute member is provided so as to correspond to the falling positions of the noodle strings separated by one of the adjacent separating teeth rows.

[0007] If the chute member is not provided in the noodle string cutting device, falling of the noodle strings is not restricted by the chute member, and swing of the noodle strings in the conveying direction is not limited. To be specific, because of the movement of the conveyor, the swing direction of the noodle strings tends to be induced to the conveying direction (vertical direction).

[0008] On the other hand, the chute member is provided at a part of the noodle string cutting device according to embodiments of the present invention, and the cut noodle strings contact the chute

member before they reach the conveyor. Therefore, the speed of the cut noodle strings in the conveying direction becomes slow, and the noodle strings are accumulated on the chute member. Thus, the noodle strings are guided onto the conveyor while swinging in the width direction (lateral direction) of the chute member.

[0009] According to the above ~~configuration~~ aspect, the noodle string cutting device of the present invention is configured such that two or more sets are formed, each of which includes the adjacent separating teeth rows and in each of which the chute member is provided so as to correspond to the falling positions of the noodle strings separated by one of the adjacent separating teeth rows.

[0010] Therefore, the noodle string cutting device according to embodiments of the present invention can form two or more sets each including the layers of the noodle strings stacked such that the swing directions of the noodle strings intersect with each other lengthwise and crosswise. On this account, as compared to a configuration in which the chute member is not included, and all the noodle strings are stacked so as to extend in the conveying direction, the sticking of the noodle strings in the steam-boiling can be reduced, and the noodle strings can be entirely and uniformly gelatinized.

[0011] Therefore, the noodle string cutting device according to embodiments of the present invention has an effect of being able to stack the noodle strings on the conveyor such that the sticking of the noodle strings in the steam-boiling can be reduced, and the noodle strings can be uniformly gelatinized.

[0012] The noodle string cutting device according to an embodiment of the present invention may be configured such that: the chute member includes a first chute member and a second chute member; and the first chute member and the second chute member are provided so as to correspond to the falling positions of the noodle strings separated by the first separating teeth row and the falling positions of the noodle strings separated by the third separating teeth row, respectively, or the first chute member and the second chute member are provided so as to correspond to the falling positions of the noodle strings separated by the second separating teeth row and the falling positions of the noodle strings separated by the fourth separating teeth row, respectively.

[0013] According to the above ~~configuration~~ embodiment, the first chute member and the second chute member are provided so as to correspond to the falling positions of the noodle strings separated by the first separating teeth row and the falling positions of the noodle strings separated by the third separating teeth row, respectively, or the first chute member and the second chute member are provided so as to correspond to the falling positions of the noodle strings separated by the

second separating teeth row and the falling positions of the noodle strings separated by the fourth separating teeth row, respectively. Therefore, the noodle strings separated by the adjacent separating teeth rows are stacked on the conveyor so as to swing in different directions.

[0014] Thus, the noodle string cutting device according to embodiments of the present invention can stack on the conveyor the noodle strings cut such that the swing directions of the noodle strings are alternately different from each other. On this account, the noodle strings are prevented from swinging only in the conveying direction to be stacked on one another. Further, the sticking of the noodle strings in the steam-boiling can be reduced, and the noodle strings can be entirely and uniformly gelatinized.

[0015] The noodle string cutting device according to an embodiment of the present invention may be configured such that: the chute member includes a first chute member and a second chute member; and the first chute member and the second chute member are provided so as to correspond to the falling positions of the noodle strings separated by the first separating teeth row and the falling positions of the noodle strings separated by the fourth separating teeth row, respectively, or the first chute member and the second chute member are provided so as to correspond to the falling positions of the noodle strings separated by the second separating teeth row and the falling positions of the noodle strings separated by the third separating teeth row, respectively.

[0016] According to the above ~~configuration~~embodiment, the first chute member and the second chute member are provided so as to correspond to the falling positions of the noodle strings separated by the first separating teeth row and the falling positions of the noodle strings separated by the fourth separating teeth row, respectively, or the first chute member and the second chute member are provided so as to correspond to the falling positions of the noodle strings separated by the second separating teeth row and the falling positions of the noodle strings separated by the third separating teeth row, respectively. Therefore, in a state where the noodle strings separated by the first to fourth separating teeth rows are stacked, there are two sets each including the layers of the noodle strings stacked such that the swing directions of the noodle strings intersect with each other. Therefore, as compared to a configuration in which the first chute member and the second chute member are not included, and the noodle strings are stacked such that the swing direction of all the noodle strings is the conveying direction, the sticking of the noodle strings in the steam-boiling can be reduced.

[0017] The noodle string cutting device according to an embodiment of the present invention may be configured such that the chute member is provided so as to correspond to the falling positions of the noodle strings separated by the second separating teeth row or the third separating teeth row.

[0018] According to the above ~~configuration~~ embodiment, the chute member is provided so as to correspond to the falling positions of the noodle strings separated by the second separating teeth row or the third separating teeth row. Therefore, in a state where the noodle strings separated by the first to fourth separating teeth rows are stacked, there are two sets each including the layers of the noodle strings stacked such that the swing directions of the noodle strings intersect with each other. On this account, as compared to a configuration in which the chute member is not included, and the noodle strings are stacked such that the swing direction of all the noodle strings is the conveying direction, the sticking of the noodle strings in the steam-boiling can be reduced.

[0019] The noodle string cutting device according to an embodiment of the present invention may be configured such that: the first chute member and the second chute member include respective noodle string contacting surfaces inclined relative to the conveying direction of the conveyor and contacting the noodle strings; and the noodle string contacting surface of the first chute member and the noodle string contacting surface of the second chute member are inclined in respective directions that are different from each other or the same as each other.

[0020] ~~In order to solve the above problems, raw noodles according to~~ According to a second aspect of the present invention, there is provided raw noodles produced ~~are formed~~ by a noodle string cutting device configured to cut a dough sheet into noodle strings to supply the noodle strings to a conveyor, a transfer speed of the noodle strings by the conveyor being lower than a cutting speed at which the noodle strings are cut from the dough sheet, the noodle string cutting device including: a first cutting blade roll and second cutting blade roll configured to rotate in opposite directions in an engaged state to cut the dough sheet into the noodle strings; a first separating teeth row and second separating teeth row contacting an outer periphery of the first cutting blade roll at respective positions different from each other in a rotational direction of the first cutting blade roll and configured to separate the noodle strings from the first cutting blade roll; a third separating teeth row and fourth separating teeth row contacting an outer periphery of the second cutting blade roll at respective positions different from each other in a rotational direction of the second cutting blade roll and configured to separate the noodle strings from the second cutting blade roll; and a chute member provided so as to correspond to falling positions of any of the noodle strings separated by the first separating teeth row, the noodle strings separated by the second separating teeth row, the noodle strings separated by the third separating teeth row, and the noodle strings separated by the fourth separating teeth row and configured to guide the noodle strings onto the conveyor, wherein: the fourth separating teeth row, the third separating teeth row, the second separating teeth row, and the first separating teeth row are provided in this order from an upstream side toward a

downstream side in a conveying direction of the conveyor; and the chute member is provided such that two or more sets are formed, each of which includes the adjacent separating teeth rows among the first to fourth separating teeth rows and in each of which the chute member is provided so as to correspond to the falling positions of the noodle strings separated by one of the adjacent separating teeth rows.

[0021] According to the above ~~configuration~~ aspect, the chute member is provided so as to correspond to the falling positions of any of the noodle strings separated by the first separating teeth row, the noodle strings separated by the second separating teeth row, the noodle strings separated by the third separating teeth row, and the noodle strings separated by the fourth separating teeth row. Especially, the noodle string cutting device is configured such that two or more sets are formed, each of which includes the adjacent separating teeth rows and in each of which the chute member is provided so as to correspond to the falling positions of the noodle strings separated by one of the adjacent separating teeth rows.

[0022] Therefore, the noodle string cutting device according to embodiments of the present invention can form two or more sets each including the layers of the noodle strings stacked such that the swing directions of the noodle strings intersect with each other. On this account, when the raw noodles produced by the noodle string cutting device according to embodiments of the present invention is compared with the raw noodles which are produced by the noodle string cutting device not including the chute member and in which all the noodle strings are stacked so as to extend in the conveying direction, the sticking of the noodle strings in the steam-boiling can be reduced, and the noodle strings can be entirely and uniformly gelatinized.

[0023] Thus, the raw noodles according to embodiments of the present invention has an effect of being able to reduce the sticking of the noodle strings in the steam-boiling and entirely and uniformly gelatinize the noodle strings.

[0024] The raw noodles produced as above are used for producing instant noodles, frozen noodle, and chilled noodles. Since the sticking of the noodle strings in the steam-boiling can be reduced, the noodles which hardly cause the sticking of the noodle strings when the noodles are eaten can be provided.

Advantageous Effects of Invention

[0025] The noodle string cutting device according to embodiments of the present invention is configured as above and has an effect of being able to stack the noodle strings on the conveyor such that in the steam-boiling, the sticking of the noodle strings can be reduced, and the noodle strings can be entirely and uniformly gelatinized.

[0026] Further, the raw noodle according to embodiments of the present invention is formed as above and has an effect of being able to, in the steam-boiling, reduce the sticking of the noodle strings and gelatinize the noodle strings entirely and uniformly.

Brief Description of Drawings

[0027] Fig. 1 is a cross-sectional view showing one example of a schematic configuration of a noodle string cutting device according to the present embodiment.

Fig. 2 is a plan view showing the configurations of a first cutting blade roll and second cutting blade roll included in the noodle string cutting device shown in Fig. 1.

Fig. 3 is a diagram showing a state where the first cutting blade roll and the second cutting blade roll shown in Fig. 2 engage with each other.

Fig. 4 is a perspective view showing the configuration of a first scraper included in the noodle string cutting device according to the present embodiment.

Fig. 5 is a perspective view showing the configuration of a second scraper included in the noodle string cutting device according to the present embodiment.

Fig. 6 is a perspective view showing the configuration of a first chute member included in the noodle string cutting device according to the present embodiment.

Fig. 7 is a perspective view showing the configuration of a second chute member included in the noodle string cutting device according to the present embodiment.

Fig. 8 is a table for schematically explaining cut states of noodle strings on a conveyor, the noodle strings being cut by the noodle string cutting device according to the present embodiment.

Figs. 9A and 9B are tables showing experimental results regarding sticking states of the noodle strings. Fig. 9A shows the experimental results regarding the noodle strings cut by the noodle string cutting device according to the present embodiment. Fig. 9B shows the experimental results regarding the noodle strings cut by a chute member-excluded device.

Fig. 10 is a cross-sectional view showing one example of a schematic configuration of the noodle string cutting device according to a modified example of the present embodiment.

Fig. 11 is a cross-sectional view showing one example of a schematic configuration of the noodle string cutting device according to another modified example of the present embodiment.

Description of Embodiments

[0028] Hereinafter, a specific example of a noodle string cutting device 1 according to an